IV. Surface Water Monitoring and Assessment Information: How Clean is My Stream or Lake?

How are assessments organized?

Arizona's 2004 assessments are presented by watershed in this chapter. For each watershed, the following information is provided:

- A watershed map illustrating monitoring sites and final assessments
- Surface water quality monitoring tables
- Assessment tables

Surface Water Monitoring Tables – The information in the surface water monitoring tables may be the most valuable information in this report. The monitoring tables summarize the water quality data used and provide the final assessment of individual surface waters. The agency or organization doing the monitoring, number of samples, years sampled, and constituents exceeding standards are shown in these tables. These tables are the basis for 303(d) listing and/or delisting decisions. The information contained within is also used by many federal and state programs that permit activities that may add further discharges to these surface waters. These tables provide the most comprehensive list of monitoring activities in Arizona.

The tables are organized by site (sampling location), indicating what, if any, exceedances were found. The summary rows, indicated by gray shading, combine all of the monitoring data from all of the sites in a particular stream reach or lake, and indicate the assessment for each designated use.

Assessment Tables - These comprehensive tables bridge current assessments with past assessments and impaired waters identification. The assessment tables provide the following information:

- Assessments for each designated use: "attaining," "inconclusive," "not attaining," or "impaired" (see criteria in Chapter III)
- Which surface waters will be on the 2004 303(d) List submitted to EPA and the pollutants of concern
- Which surface waters will be added to the Planning List and the pollutants of concern or reason for this action
- Which pollutants and surface waters should be removed from the 2002 303(d) List and the reasons for this action
- Which TMDLs are ongoing or completed

As requested in EPA's *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act,* ADEQ's assessment tables place waters into one of the following five categories:

Category 1	All designated uses are met
Category 2	Some of the designated uses are attaining but insufficient data to determine if remaining designated uses are attaining or impaired (also includes threatened waters)
Category 3	Insufficient data to determine whether any designated uses are attaining their uses
Category 4	Water is impaired but a TMDL is not needed
Category 5	Water is impaired and a TMDL is needed (on the 2004 303(d) List)

Chapter V lists the assessed surface waters by these categories. Those waters on the 303(d) List (Category 5) are then prioritized for TMDL development.

How is a surface water added to or removed from the 303(d) List?

Listing and Delisting Criteria - The criteria for listing or delisting a surface water are established in the Impaired Water Identification Rule **(Appendix B)**. In general, the same amount and type of data used to place a surface water on the 303(d) List is needed to remove it from the list. For example, if two bacterial exceedances in a 3-year period put it on the list, then no exceedances in a 3-year period could remove it from the list (one exceedance would be inconclusive). However, the data must be collected during similar hydrologic or climatic conditions (i.e., critical conditions) that occurred when samples were taken that indicated impairment, if those conditions still exist. All data must meet the credible data requirements.

When a water is assessed as "impaired," it is added to the 303(d) List. As noted in Chapter III, a designated use is impaired if any of the following occur:

A. For most standards (except situations in B, C, and D below),
   1. 20 or more samples with the minimum number of exceedances listed in Table 2 (the 303d List) in the Impaired Water Identification Rule, and

2. Collected during three or more temporally independent sampling events.

B. For acute Aquatic and Wildlife acute standards, the nitrate and nitrite/nitrate standard, and single sample maximum bacteria standards:

1. More than one exceedance during temporally independent sampling events within a 3-year period, and

2. Fewer than three years of samples since last exceedance.

C. For Aquatic and Wildlife chronic standards, more than one exceedance during temporally independent sampling events.

D. For an annual mean (nutrients), 90th percentile (nutrients), or geometric mean (*Escherichia coli* or SSC), more than one exceedance within the assessment period.

The criteria for removing a surface water from the 303(d) List can be summarized as follows:

- There are sufficient credible data to determine that the surface water is assessed as "attaining" its designated uses based on numeric and/or narrative criteria for the pollutant of concern (see criteria in Chapter III).
- A TMDL has been completed.
- An EPA approved change in the applicable surface water quality standard or designated use results in the surface water meeting standards.
- Neither the older data nor the current data is sufficient to meet the new impaired waters identification criteria. For example, there was an insufficient number of samples, sampling events, or exceedances.
- Investigations reveal that impairment is not due to a pollutant or surface water quality characteristic but rather due to "pollution" or other situation that cannot be readily addressed through a TMDL (e.g., hydrologic modifications.
- Investigations reveal that pollutant loadings from naturally occurring conditions alone are sufficient to cause a violation of applicable water quality standards.
- Reach is split and no current or historic data exist in one portion of the list that would support a listing.

A list of surface waters and pollutants being removed from the 2002 303(d) List is presented in Chapter V. In many cases, a surface water is simply moved from the 303(d) List to the Planning List for further monitoring or other action unless all designated uses are assessed as "attaining."

EPA Additions to the 303(d) List – In the tables in this chapter, a notation indicates which surface waters were added to the 2002 and 2004 303(d) Lists by EPA. This "overfiling" occurred because EPA is not bound by Arizona's Impaired Water Identification Rule nor Arizona's TMDL Statute (Appendix B), and has retained the authority through federal regulation (CFR 130.7(d)) to revise states' 303(d) lists. In 2002, EPA added 19 additional surface waters to the 303(d) List and added three additional pollutants to surface waters already listed. In 2004, EPA has added 19 surface waters, as well as eight additional pollutant on waters already listed. The Agency identified the following situations where waters should have been listed according to federal guidelines, but were not on the Section 303(d) List submitted by Arizona:

- A fish consumption advisory has been issued based on pollutant concentrations in fish tissues collected in Arizona. EPA finds this to be evidence of narrative standards violations.

- Available data indicate that surface waters "substantially" exceed the state's water quality standards for specific pollutants. EPA concluded that the state's decision to not list waters with fewer than 20 samples was inconsistent with federal listing requirements if there were sufficient exceedances to support a reliable conclusion that standards are not being attained. Specifically this occurred:
  - If there were 3 or more exceedances and ten or fewer samples collected, or
  - If there were 5 or more exceedances and fewer than 20 samples collected.

- Exceedances of the repealed turbidity standard provide evidence of non-attainment of the narrative standard for excessive bottom deposits.

Note that all waters placed on the 2002 303(d) List by EPA remained on the list and are indicated as "impaired." These waters will be delisted when they meet requirements established in Arizona's Impaired Water Identification Rule for delisting (e.g., TMDL complete, changes in standards, sufficient new data indicate that designated uses are being attained).

To make Arizona's and EPA's assessment and listing criteria more compatible, ADEQ is currently developing narrative implementation procedures that will provide the basis for Arizona to make a 303(d) listing due to narrative water quality standards violations. ADEQ has also proposed several other changes to the Impaired Water Identification Rule and Surface Water Quality Standards to facilitate assessments.

How is a surface water added to or removed from the Planning List?

Surface waters with any designated uses assessed as "inconclusive" or "not attaining" are placed on the Planning List for further monitoring. The Impaired Water Identification Rule (R18-11-605.C) provides a list of specific criteria for why a surface water must be placed on the Planning List, such as:

- Exceedances of standards
- Data available does not meet credible data requirements
- Indications of narrative water quality standard violations, but no narrative implementation procedures established as required
- A TMDL has been completed

However, ADEQ has added other "inconclusive" waters to its internal Planning List. These waters need additional monitoring due to one of the following reasons:

- Insufficient core parameter coverage
- Insufficient monitoring events

Planning List delisting criteria -- Criteria for removing a surface water or pollutant from the Planning List are also established in the Impaired Water Identification Rule (R18-11-605.E). A surface water is removed from the Planning List based on one of the following criteria:

- The surface water is assessed as impaired and added to the 303(d) List.
- There are sufficient data to determine that the surface water is "attaining" all of its designated uses.

Actually, a surface water may be on both the Planning and 303(d) Lists due to different parameters of concern. As stated above, the only way to be removed from both the Planning List and the 303(d) List is to be assessed as "attaining all uses."

The West Fork of the Little Colorado River, near Greer, Arizona, is on ADEQ's Planning List due to missing core parameters. Core parameters are a set of water quality parameters that ADEQ has deemed necessary to make a full assessment of a stream or lake.

Overview of Assessment Terms and Criteria

Criteria for assessing designated uses and surface waters are provided in Chapter III, along with definitions for designated uses and the "core parametric coverage." These definitions and criteria are complex, so information in Chapter III should be reviewed before looking at tables in this chapter. However, to facilitate review of the assessment tables, summary definitions of some assessment terms are provided below:

Assessing Each Designated Use

Each designated use is assessed as follows:

Attaining – All surface water quality standards are being met based on a minimum of 3 monitoring events that provide seasonal representation and core parametric coverage. **Threatened** waters are a subset of "attaining," where a surface water quality standard is currently being met, but a trend analysis indicates that the surface water is likely to be impaired before the next assessment.

Impaired – A surface water quality standard is not being met based on criteria identified in the Impaired Waters Identification Rule (**Appendix B**).

Not Attaining – A designated use would be assessed as "impaired" except that a TMDL does not need to be completed for one of the following reasons:
A. A TMDL has already been completed and approved by EPA but the surface water is not yet attaining uses.
B. Other pollution control requirements are reasonably expected to result in the attainment of water quality standards by the next regularly scheduled listing cycle.
C. The impairment is not related to a "pollutant" loading, but is caused by "pollution" (e.g. hydrologic modification).

Inconclusive – Monitoring or other assessment information available is insufficient to assess the surface water as "attaining," "threatened," "impaired," or "not attaining."

Combined Assessment of Uses

The individual designated use assessments are combined to provide an assessment of the surface water and each surface water is placed on one of the following five assessment lists:

Attaining All Uses -- all designated uses are assessed as "attaining" **(Category 1)**,

Attaining Some Uses – at least one designated use is assessed as "attaining" and others are assessed as "inconclusive" or "threatened" **(Category 2)**.

Inconclusive – All designated uses are assessed as "inconclusive" **(Category 3)**. (Note that all surface waters that were not assessed due to insufficient credible data are by default assessed as being in Category 3.)

Not Attaining – One or more designated use is assessed as "not attaining" and none are assessed as "impaired" **(Category 4)**.

Impaired – One or more designated use is assessed as "impaired" **(Category 5)**.

Designated Uses

Designated uses are specified for stream segments and lakes in the surface water rules (A.A.C. R18-11-104 and 105). Arizona's surface water designated uses include:

Aquatic and Wildlife
- **Coldwater Fishery** (A&Wc)
- **Warmwater Fishery** (A&Ww)
- **Ephemeral Stream** (A&We)
- **Effluent Dependent Water** (A&Wedw)

Full Body Contact (FBC) (i.e., swimming)

Partial Body Contact (PBC) (i.e., non-swimming recreation)

Fish Consumption (FC)

Domestic Water Source (DWS)

Agricultural Irrigation (AgI)

Agricultural Livestock Watering (AgL)

Core Parametric Coverage

Required to Assess a Designed Use as "Attaining" Uses:

Aquatic and Wildlife -- Dissolved oxygen, flow (if a stream) and depth (if a lake), hardness, pH, turbidity/suspended sediment concentration, total nitrogen and total phosphorus, dissolved metals (cadmium, copper, and zinc)

Fish Consumption – Total mercury

Full Body or Partial Body Contact – *Escherichia coli,* pH

Domestic Water Source – Nitrate/nitrite or nitrate, pH, total fluoride, total metals (arsenic, chromium or chromium VI, and lead)

Agriculture Irrigation – Total boron, total manganese, pH

Agriculture Livestock Watering -- Total metals (copper and lead), pH

Notes:
*Nitrogen and phosphorus are required only in surface waters with nutrient standards.
*In ephemeral waters, the following parameters are not required, dissolved oxygen, turbidity/suspended sediment concentration and *Escherichia coli*.
*In effluent dependent waters and all lakes, suspended sediment concentration is not required.